Mediators of childhood trauma and suicidality in a cohort of socio-economically deprived Scottish men

Mediators of Childhood Trauma and Suicidality in a Cohort of Socio-Economically Deprived Scottish Men.

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Running head: trauma and suicidality in men

Disclosures and Acknowledgements: We thank the staff and service-users of the Men's SHARE Project for their time and contribution. We have no disclosure to make.

Word count: 4652 words

Abstract

Background: There is little research investigating the relationship between childhood abuse, including neglect, and suicidality in adult men, despite epidemiological data suggesting that they are most at risk for suicide. **Objective**: To investigate the relationship between childhood abuse and neglect and suicidality, and the possible mediating roles of affect dysregulation and social inhibition. **Participants and Setting**: a cohort of eighty-six socio-economically deprived male Caucasian participants previously identified as suicidal, attending a non-clinical community group. **Methods**: Participants completed self-report measures on childhood trauma, emotion regulation, interpersonal difficulties and suicidal behavior. **Results**: Mediation analysis indicated that emotion dysregulation and interpersonal difficulties significantly mediated the relationship between childhood trauma and suicidality with a medium effect size ($R^2 = .41$, $p<.001$). **Conclusions**: Study results suggest that early childhood abuse and neglect results in dysfunctional emotion regulation, which leads to suicidality in the context of impoverished social environments. The provision of psychological interventions aimed at improving social and emotional functioning may help to safeguard men who are most at risk of suicide.

167 words

Keywords: Risk factors, suicide, childhood abuse, childhood neglect, male psychology, interpersonal problems

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Scotland's suicide rate (15.0 deaths per 100,000) is above average for high-income countries globally (12.7/100,000) and the rest of the United Kingdom (10.4/100,000) (WHO, 2014; Office for National Statistics, 2016; Scottish Government 2013). Globally, men account for three-quarters of completed suicides and those aged 45-49 are nearly twice as vulnerable as the wider male population (WHO, 2014; Samaritans, 2016). This gender disparity is projected to increase (Bertolote & Fleischmann, 2002). Consequently, WHO Member States have committed to a 10% reduction in overall suicide rates by 2020 (WHO, 2017). Understanding the causes and mediators of suicidality is critical to this.

Childhood abuse increased the risk of attempted suicide amongst adults by three-five times in a large cohort collected as part of a retrospective Adverse Childhood Events (ACEs) study (Dube et al., 2001). Childhood physical abuse was reported by 7.8% of suicide attempters versus 2.2% of non-attempters, emotional abuse by 14.8% compared to 2.5% of non-attempters, and sexual abuse by 9.1% compared to 2.4% of non-attempters. There was no gender difference relating to influence of childhood risk factors (ACEs).

Childhood sexual abuse (CSA) appears to confer the greatest risk with lifetime suicide attempts 10 times more likely compared to those who have not experienced CSA (Bebbington et al., 2009), and evidence for a stronger effect on later suicidal ideation and attempts than childhood physical abuse (CPA; Fergusson, Boden & Horwood, 2008), and other forms of abuse (see Coll, Law, Tobías, Hawton & Tomàs, 2001; Osvath, Vörös & Fekete, 2004; O'leary & Gould, 2009). These findings assume that sexual abuse happens in isolation. However, perpetrators may employ additional physically or emotionally abusive strategies to maintain the secrecy of the sexual abuse. As such, the delineation of discrete types of abuse and neglect within research settings can be problematic, and the focus on CSA

in the literature may contribute to inattention to other forms of abuse, especially emotional. CPA and childhood emotional abuse have been found to increase risk of suicidality (5-fold and 12-fold respectively) in adult life (Mullen, Martin, Anderson, Romans & Herbison, 1996), and high childhood emotional neglect scores have been found in suicidal people compared to non-suicidal controls (Kaslow, Thompson, Brooks & Twomey, 2000; Sfoggia, Pacheco & Grassi-Oliveira, 2008). However, other studies have failed to replicate this (Sarchiapone et al., 2009, Ystgaard, Hestetun, Loeb & Mehlum, 2004), reflecting the complexity of neglect and diversity in definition and measurement.

Although evidence suggests that the presence of child abuse and maltreatment should be considered a general risk factor for suicidality (Santa Mina & Gallop, 1998; Maniglio, 2009; Norman, Byambaa, De, Butchart & Vos, 2012), little is known about factors associated with and mechanisms by which child abuse leads to suicidality, such as emotion regulation or interpersonal difficulties (Joiner, Brown & Wingate, 2005), in male populations. A link has been established empirically between experiencing early emotionally charged events such as childhood trauma and subsequent emotion dysregulation in child (e.g. Kim & Cichetti, 2010; Messman-Morre, Walsh & DiLillo, 2010) and adult (e.g. Carvalho-Fernando et al., 2014) female clinical populations. This has yet to be examined in males. Gender differences in emotion regulation have been widely found in relation to use of strategies, such as more frequent use of expression suppression in males (Zhao, Zhang & Zheng, 2014; Masumoto, Taishi & Shiozaki, 2016); or higher levels of ruminative affect regulation strategies in females (Kwon, Yoon, Joorman & Kwon, 2013). Gender differences are also seen in the role of affect regulation in mediating the relationship between, for example daily hassles and non-suicidal self-injury, in which males show more brooding and experiential avoidance (Xavier, Cunha & Pinto-Gouveia, 2017). These gender differences persist across age (Zimmermann &

Iwanski (2014) and across cultures. These findings illustrate that evidence relating to emotion regulation in women should not be assumed to apply to men.

A consistent limitation in the evidence base is the predominance of female samples. Despite men in their middle years being most at risk of suicidality, there is little research on trauma and negative outcomes in men (Kirtley and O'Connor, in Wyllie et al., 2012), possibly because male victims are unlikely to seek help (Galdas, Cheater & Marshall, 2005) or disclose abuse experiences. This problematic coping strategy (Holmes, Offen & Waller, 1997) may be driven by guilt or shame (Dyer et al*.,* 2009; Dyer, Dorahy, Shannon & Corry, 2013).

Male suicidality has been found to be more common in socioeconomically disadvantaged individuals (Johnson et al., 2002; Gunnell, Harbord, Singleton, Jenkins & Lewis, 2004; Dennis, Baillon, Brugha, Lindesay, Stewart & Meltzer, 2007; Samaritans, 2017), although the association between socio-economic status and suicidality is not a direct cause-effect relationship, but is instead influenced by associated factors such as unemployment, impoverished social network, household income, stressful life events, and housing situation (Gunnell et al., 2004).

Theory and evidence derived from cross-sectional studies with youth suggest suicidality may serve a regulatory function for those with limited emotional regulation strategies (e.g. Rajappa, Gallagher & Miranda, 2012) in which difficulties understanding and accepting distressing emotions leads to suicide attempts as a means of escape from such emotions. Generalizability beyond these samples is limited because emotion dysregulation is a normative aspect of adolescent development (Dahl, 2001), and both suicidal and non-suicidal self-injury (NSSI) are more common during adolescence (Morgan et al., 2017). In addition, potential confounding variables such as lack of social support (Kleiman & Liu, 2013) are neither adequately measured nor controlled across studies. Nonetheless, one could

predict from the research that experiencing childhood trauma such as physical, emotional and sexual abuse, and neglect negatively affects emotion regulation, which subsequently leads to suicidality.

Three studies lend support to this hypothesis. Briere, Hodges and Godbout (2010) used structural equation modeling in a general adult population sample to establish affect dysregulation as a significant mediator in the relationship between interpersonal trauma (not specified to childhood) and 'dysfunctional avoidance', a construct consisting of four components including suicidality. They did not investigate possible gender effects. Chaplo, Kerig, Bennett and Modrowski (2015) found, in a sample of homeless youth, that emotion dysregulation partially mediated (through Dissociation) the relationship between sexual abuse and NSSI in detained youth. Gender effects were found in which the association between sexual abuse and NSSI was stronger for females. Finally, Barr, Fulginiti, Rhoades & Rice (2017) found that emotional control mitigated the effects of trauma (not childhood specifically) on PTSD symptoms, and that lower emotional awareness and emotional control, both aspects of emotion regulation, were associated with suicidality. However, we have found no research investigating emotion regulation as a potential mediating factor in the relationship between childhood trauma and adult suicidality, let alone in men specifically.

Relational difficulties such as social inhibition and social isolation are commonplace in individuals with abuse histories (Herman, 1992; Davis, Petretic-Jackson & Ting, 2001; Huh, Kim, Yu & Chae, 2014), and have been implicated in suicidality (Meltzer, 2002; Milnes, Owens & Blenkiron., 2002), particularly in adolescent (see King & Merchant, 2008 for a literature review) and undergraduate samples (Zaroff, Wong, Ku & Van Schalkwyk, 2014), but also in adults aged 45 years (Stansfeld, Clark, Smuk, Power, Davidson & Rodgers, 2017) where interpersonal difficulties mediated the association between childhood physical and sexual abuse and midlife suicidal ideation, with apparent gender differences. Such

findings are in keeping with the Interpersonal Theory of Suicide (Joiner, Brown & Wingate, 2005), which emphasizes the risk posed by perceived burdensomeness, and social isolation (thwarted belongingness), contrasting with the protection provided by good social support (see McLean, Maxwell, Platt, Harris & Jepson, 2008). A recent review confirmed the role of these variables, but highlighted that female samples were heavily over-represented (Ma, Batterham, Calear & Han, 2016), and that generalizability to males could not be assumed.

Interpersonal problems and affect regulation overlap in that social support and appropriate help-seeking from others both constitute adaptive affect regulation strategies. Lang and Sharma-Patel (2011) argue that proposed functional explanations of suicidality include elements of affect-regulation as well as interpersonal motivations, linked in the attachment system (Bornstein, Suwalsky & Breakstone, 2012; Bowlby, 1969). Attachment theory (Bowlby, 1969) plays a pivotal role in how we conceptualize the impact of childhood trauma on interpersonal relationships in adulthood. There is a wealth of research suggesting that insecure attachment styles often result from childhood trauma and that one's attachment style can substantially contribute to later psychological adjustment. Murphy et al. (2014) found an association between ACEs and unclassifiable (disorganized) adult attachment. A meta-analysis of 46 studies established an effect of insecure attachment on later symptoms of post-traumatic stress; fearful attachment had an overall effect size of p̆=.44 (Woodhouse, Ayers & Field, 2015), and develops in the context of childhood neglect and abuse (Schimmenti & Bifulco, 2015; Schimmenti & Caretti, 2018). Wrath & Adams (2018) found 13 of 17 studies associated insecure attachment with self-injury in adults (see Barazonne et al., 2018 for a review of the literature associating insecure attachment and PTS symptoms).

Herman's (1992) model of complex Post Traumatic Stress Disorder (c-PTSD) posits that relational difficulties such as social inhibition and social isolation are commonplace in individuals with abuse histories. This theorized link between childhood trauma and later

interpersonal difficulties has been evidenced empirically in clinical (Huh et al., 2014) and community samples (Davis et al., 2001). Whilst we would not expect to see gender differences in attachment *per se,* there is evidence linking gender differences in emotion regulation to parenting approach in the early years (Chen, Wu & Wang, 2018), possibly illustrating one of the mechanisms by which attachment influences emotion regulation and how gender differences develop.

In summary, whilst the relationship between childhood trauma and suicidality is well-evidenced, research on the mechanisms mediating this association are less well understood. Affect dysregulation is a known risk-factor for suicidality, and the Interpersonal Theory of Suicide has mapped out the role of interpersonal problems in suicidality. These two constructs overlap in theory and practice, and as such risk being conflated. There is a case for examining the individual contributions of affect dysregulation and interpersonal problems to the relationship between childhood trauma and suicidality. Despite men being at much higher risk of completing suicide, irrespective of context, the suicide literature is over-reliant on female samples, a bias also reflected in the childhood trauma literature, whilst studies on affect regulation and suicidality concentrate on adolescent samples. Given gender differences have been found in studies of affect regulation and the dearth of research with men more generally, there is a clear need to redress this imbalance to ensure that the needs of adult men with suicidality are better understood and responded to.

Aims of the Study

One may hypothesize that abuse and neglect interfere with a child's capacity to learn effective affect-regulation and social problem solving skills. In turn, emotion dysregulation along with overlapping interpersonal functioning difficulties may significantly contribute to male suicidal risk in adulthood. To our knowledge, there remains a gap in the empirical literature for the investigation of emotion regulation and interpersonal difficulties in the

relationship between childhood trauma and suicidality in adult men. Based on existing research, the following hypotheses were tested using a quantitative cohort survey design:

1. Emotion dysregulation will mediate the relationship between childhood trauma and suicidality in socio-economically disadvantaged males.
2. Interpersonal difficulties will mediate the relationship between childhood trauma and suicidality in socio-economically disadvantaged males.

The inclusion of emotion dysregulation and interpersonal difficulties in the same mediation models will allow differentiation of relative effects of these overlapping constructs on the association between childhood trauma and suicidality.

Material and Methods

Participants

A sample of 86 adult men was recruited from the Men's Suicide, Harm, Awareness, Recovery and Empathy (SHARE) Project, a community project based in an area of socio-economic deprivation in Scotland. This area has several ex-mining villages in which there are limited employment opportunities for people without post-secondary school education, and unemployment may be multi-generational. Funded by the Scottish Government's Choose Life Suicide Prevention Strategy 2013-2016, Men's SHARE adopts a prevention and intervention approach for men with past and/or current suicidality, offering open-ended weekly support groups and optional one-to-one sessions with the project worker. Every man who accessed the service over a five-month period was approached to take part, irrespective of his length of engagement with the service.

Potential participants were included if they were male; aged over 18; had experienced suicidality in the past; had a sufficient understanding of the English language to respond to questionnaires and were able to provide informed consent. Potential participants with a

moderate to severe learning disability were excluded from the current study. A total of 98 service users were engaged with the Men's SHARE project over the recruitment period (November 2016 to March 2017). Four men did not meet the inclusion criteria. The remaining 94 were invited to take part. Seven individuals declined participation. The total sample consisted of 86 men representing a response rate of 91.49%. The mean age of participants was 41.9 years (SD = 12.10, median = 42.00), ranging from 18 to 69 years.

The majority of participants were educated to high school level only (51.2%). Consistent with the status of the geographical location as an area of multiple deprivation, most participants earned between £5,000 and £10,399 per annum (32.6%), below the poverty threshold of £14,133 per annum (60% of UK median income) (Poverty and Social Exclusion, 2016), and indicative of unemployment or reliance on benefits to supplement low-wage work. Fifty-nine men (68.6%) were out of work at the time of their participation. Further demographic information is provided in Table 1.

Table 1. Sample demographic characteristics.

		N	%
Ethnicity	Caucasian	86	100
Marital status	Married or cohabitating	22	25.6
	In a relationship but living separately	10	11.6
	Divorced	16	18.6
	Widowed	1	1.2
	Single	37	43.0
Income	Less than £5,000	12	14.0
	£5,000 to £10,399	28	32.6
	£10,400 to £15,599	25	29.1
	£15,600 to £20,799	11	12.8
	£20,800 to £25,999	5	5.8
	£26,000 to £36,399	1	1.2
	£36,400 to £51,999	4	4.7
	£52,000 to £77,999	0	0.0
	£78,000 or more	0	0.0
Level of education	Less than high school	2	2.3
	High school	44	51.2
	Technical trades	30	34.9
	University	6	7.0
	Postgraduate or professional	4	4.7

Employment	Employed	23	26.7
	Self-employed	4	4.7
	Out of work but looking for work	10	11.6
	Out of work & not currently seeking work	13	15.1
	Student	1	1.2
	Retired	4	4.7
	Unable to work	31	36.0
Received diagnosis?	Yes	64	74.4
	No	22	25.6
Self-reported mental health diagnosis[a]	Attention deficit hyperactivity disorder	2	3.03
	(ADHD)	17	25.76
	Anxiety and Depression (dual diagnosis)	1	1.52
	Autism Spectrum Disorder (ASD)	3	4.55
	Bipolar disorder	27	40.91
	Depression	1	1.52
	Neurosis	2	3.03
	Personality disorder	8	12.12
	Post-traumatic stress disorder (PTSD)	3	4.55
	Psychosis	1	1.52
	Work-related stress[b]	2	3.03
	Not articulated		
Received (talking) therapy?	Yes	43	67.2
	No	21	32.8
Professional Seen[c]	Alcohol/drug counselor	2	4.16
	Army	1	2.08
	Community Mental Health Worker (CMHW)	1	2.08
	Community Psychiatric Nurse (CPN)	3	6.25
	Counselling	2	4.16
	Psychiatrist	19	39.58
	Psychologist	20	41.67

[a]Percentages calculated from total number of diagnoses reported (N=66)
[b]General practitioners commonly use this term to describe non-specific mental health problems preventing someone from being able to attend employment.
[c]Percentages calculated from total number of professionals seen (N=48). Some participants saw more than one professional, hence total > 43.

Measures

Demographic information was obtained from a self-report questionnaire, capturing the respondent's age, ethnicity, marital status, and current average annual household income, level of education, employment status, self-reported history of mental health diagnoses ("Have you ever experienced a diagnosis of a mental health disorder. If yes, please give details") and whether they had ever received a form of talking therapy ("Have you ever

received a form of talking therapy, for example from a psychiatrist, psychologist or community mental health worker? If yes, please give details").

The Childhood Trauma Questionnaire (CTQ) (Bernstein & Fink, 1998) is a standardized 28-item, retrospective self-report measure of five types of childhood maltreatment: emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect, scored on a five-point Likert scale. Higher total scores indicate greater levels of trauma experienced. In addition to a total score for each trauma domain and a whole scale score, a minimization/denial scale is calculated from three items, which identifies false-negative reports of child abuse. A previous validation study found this sub-scale has no predictive value in relation to the rest of the CTQ but does associate with other clinical variables (MacDonald, Thomas, MacDonald & Sciolla, 2015). The three items were included in data collection but not in the analysis. The CTQ has been validated in clinical and non-clinical populations and has demonstrated robust psychometric properties (Baker & Maiorino, 2010) and good convergent validity between clinicians' ratings and CTQ scores (Bernstein et al*.,* 2003; Bernstein & Fink, 1998). For the purposes of the current study, the total score was used. Cronbach's alpha for the total scale score was .89. Sub-scale scores are presented in the Results for illustrative purposes (Table 2), along with Cronbach's alphas.

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a standardized 36-item self-report, multidimensional measure of difficulties in emotion regulation, scored on a five-point Likert scale with six subscales: non-acceptance of emotional response, difficulty engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to regulation strategies and lack of emotional clarity. The measure has good psychometric properties (Gratz & Roemer, 2004). For the purposes of the current study, the DERS total score was chosen for the mediation analysis. Cronbach's alpha for the total score scale was .83.

The Inventory of Interpersonal Problems (IIP-32; Horowitz, Alden, Wiggins & Pincus, 2000) is a 32-item, standardized, self-report measure of an individual's most salient interpersonal difficulties, scored according to a five-point Likert scale. Items are summed to generate a score on eight interpersonal domains. The measure has demonstrated excellent internal consistency for all items (α= .90) and acceptable test-retest reliability of the subscales (r = .64 to .84) (Barkham, Hardy & Startup, 1996). For the purposes of the current study, the socially inhibited subscale was chosen for the mediation analysis. Horowitz et al. (2000) posit that individuals who score highly on the social inhibition subscale of the IIP-32 are avoidant and detached from social relationships, which may result in pervasive social isolation. Surveying 9,377 adults from the UK 1958 British Birth Cohort Study, Stansfeld et al. (2017) found social isolation to predict midlife suicidal ideation. This suggests that interpersonal risk factors such as social isolation persist into adulthood and that these can significantly contribute to suicidality throughout the life course. Similarly, Johnson et al. (2002) found that interpersonal difficulties such as social isolation mediate the relationship between maladaptive parenting/abuse and suicide attempts in adolescence and adulthood. Moreover, in a clinical cohort study, Rajalin et al. (2017) found that suicide attempters were one standard deviation higher than those from the normative sample on the domain of social inhibition as measured by the Inventory of Interpersonal Problems (IIP). These findings are in keeping with the Interpersonal Theory of Suicide (Joiner, Brown & Wingate, 2005), which emphasizes the risk that social isolation (thwarted belongingness) can have on suicidality. Moreover, the finding that good social support and interpersonal functioning protects against suicidality is commonplace in the literature (see McLean et al., 2008). Cronbach's alpha for the socially inhibited subscale score was .83.

The Suicide Behaviors Questionnaire-Revised (SBQ-R; Osman, Bagge, Gutierrez, Konick, Kopper, & Barrios, 2001) is a brief 4-item self-report questionnaire assessing four

different dimensions of suicidality, assessing lifetime suicide ideation, frequency of suicidal ideation over the past year, threat of suicide attempt, and likelihood of future suicidality, providing a total score between 3 and 18. Higher scores indicate greater levels of suicidality. Osman et al. (2001) posit a cutoff score of ≥7 for an adult general population. The SBQ-R has demonstrated good internal consistency in the adult psychiatric inpatient sample ($\alpha = .87$; Osman et al., 2001). For the purposes of the current study, the SBQ-R total score was used. Cronbach's alpha for the total score scale was 0.71.

Ethical Considerations

Ethical approval was gained from the XX University Ethics Research Panel. Participants were recruited into the study following full-informed consent with additional support to participate (e.g. literacy assistance) available as needed. A debriefing protocol was employed.

Statistical Analyses

Data were analyzed using SPSS Version 22. Preliminary data exploration was conducted using descriptive statistics and tests of normality. Bivariate correlations were carried out to assess relationships between key variables. Possible covariance of demographic variables was also considered. To address the research hypotheses, a parallel mediation analysis was carried out using the PROCESS plug-in for SPSS (Preacher & Hayes, 2008). A mediation effect is said to be significant if the upper and lower bounds of the bias corrected bootstrapped confidence intervals do not contain zero i.e. the mediation effect is not zero at $p < .05$.

To test the overall fit of a regression model, Green (1991) proposes the following formula; $N \geq 50 + 8m$ whereby 'N' is the number of participants and 'm' is the number of predictor variables. As per this formula, the sample size required to detect moderate effect

sizes is 74. Calculated using Daniel Soper's a priori sample size calculator for multiple regression the minimum sample size required for the study was 76 (Soper, 2017). This is based on a power level of 0.8 (Cohen, 1988) for a medium effect size of 0.15 at a significance level of 0.05 with three predictor variables (childhood trauma, emotion regulation and interpersonal difficulties). These power calculations were considered appropriate because the current study employs Preacher and Hayes' (2008) multiple mediation approach, which employs regression coefficients for bootstrapping.

Results

The Shapiro-Wilks test of normality revealed that the distribution of data relating to childhood trauma as measured by the CTQ differed significantly from a normal distribution ($W = .960$, $df = 86$, $p < 0.05$) with a right skew. Data for the remaining variables (DERS, IIP-32 socially inhibited and SBQ-R) did not significantly differ from a normal distribution. Calculations showed no significant skewness or kurtosis. As such, parametric tests were selected to investigate bivariate correlations and address the study hypotheses. Means and standard deviations for all scale totals are reported in Table 2.

Table 2. Summary descriptive statistics for all variables measured.

Measure	N items	Maximum score for scale	Mean	SD	Range	Cronbach's α
CTQ[1]	25	100	59.80	21.17	86	.89
EA[2]	5	20	12.97	5.95	20	.90
PA[3]	5	20	10.99	5.90	20	.90
SA[4]	5	20	7.96	4.84	19	.97
EN[5]	5	20	6.55	5.68	20	.90
PN[6]	5	20	11.16	4.19	16	.65
DERS[7]	36	180	126.66	29.11	126	.83
IIP-SI[8]	4	16	10.48	4.32	16	.83
SBQ[9]	4	18	11.51	3.49	15	.71

[1]Childhood Trauma Questionnaire total score; [2]Emotional Abuse; [3]Physical Abuse; [4]Sexual Abuse; [5]Emotional Neglect; [6]Physical Neglect; [7]Difficulties in Emotion Regulation Scale; [8]Inventory of Interpersonal Problems – Socially Inhibited; [9]Suicide Behaviors Questionnaire

Six participants (7.0%) scored below and 80 participants (93.0%) scored above the clinical cutoff of ≥ 7 (56) for suicidality. Seven participants (8.1%) reported no childhood trauma. Four participants (4.7%) reported one type of trauma, 17 participants (19.8%) reported two types of trauma, 16 participants (18.6%) reported three types, 17 participants (19.8%) reported four types and 25 participants (29.1%) reported five different types of childhood trauma. Of note, the highest reported prevalence was found for emotional neglect. Further details regarding childhood trauma are presented in Table 3.

Table 3: Prevalence of childhood trauma

Type of Abuse	None N (%)	Low – Moderate N (%)	Moderate – Severe N (%)	Severe – Extreme N (%)	Total Sample N (%)
EA	24 (27.9%)	14 (16.3%)	17 (19.8%)	31 (36.0%)	62 (72.1%)
PA	34 (39.5%)	12 (14.0%)	12 (14.0%)	28 (32.6%)	52 (60.5%)
SA	53 (61.6%)	7 (8.1%)	8 (9.3%)	18 (20.9%)	33 (38.4%)
EN	14 (16.3%)	18 (20.9%)	11 (12.8%)	43(50.0%)	72 (83.7%)
PN	26 (30.2%)	6 (7.0%)	24 (27.9%)	30 (34.9%)	60 (69.8%)

Bivariate (Pearson's *r*) correlations were performed to investigate relationships between the key variables. These relationships are presented in Table 4. Unsurprisingly, all types of childhood trauma significantly correlated with one another. The CTQ total score significantly correlated with the DERS total score ($r = .332$, $p < .01$; moderate effect) and also with the IIP-32 socially inhibited subscale ($r = .273$, $p < .05$; small effect). All types of childhood trauma other than sexual abuse ($r = .164$, $p = .131$, ns) were found to significantly correlate with emotion dysregulation.

Table 4. Pearson's correlation matrix showing relationships between variables

	CTQ	EA	PA	SA	EN	PN	DERS	IIP-SI	SBQ
CTQ	1	.812**	.787**	.661**	.796**	.793**	.332**	.273*	.299**
EA		1	.633*	.360**	.589**	.506**	.315**	.195	.223*

PA	1	.389**	.435**	.530**	.262*	.238*	.359**
SA		1	.372**	.429**	.164	.117	.187
EN			1	.677**	.238*	.284**	.129
PN				1	.308**	.209	.252*
DERS					1	.558**	.581**
IIP-SI						1	.504**

* Correlation is significant at the .05 level (2-tailed); ** Correlation is significant at the .01 level (2-tailed); [a]Socially-Inhibited subscale

Of all potential confounding variables measured, only participants who had received a diagnosis of a mental health problem reported significantly higher levels of suicidality (M = 12.13, SD = 3.36) compared to those who had not (M = 9.73, SD = 3.31). As such, the covariate (diagnosis received) was included in the mediation analysis because of its theoretical and empirical association with the dependent variable (suicidality). Other demographic variables including employment, income and relationship status were not tested because the current sample was considerably skewed towards low employment, low income and living alone; a unique feature of the recruited population.

Mediation Analysis

As a significant relationship was observed between the independent variable (childhood trauma) and the dependent variable (suicidality) possible mediation effects could be assessed (Hayes, 2013). A parallel mediation analysis was carried out to test the hypotheses that emotion dysregulation and interpersonal difficulties (social inhibition) mediate the relationship between childhood trauma and suicidal behavior.

Field (2009) argues that high correlations (above 0.9) between variables may suggest significant multicollinearity and as such, these variables should not be included in the same mediation analysis. Significant correlations were found between three predictor variables:

childhood trauma and emotion dysregulation ($r = .332$, $p < .01$; a moderate effect), childhood trauma and social inhibition ($r = .273$, $p < .05$; a small effect) and emotion dysregulation and social inhibition ($r = .558$, $p < .01$; large effect). As none of the effect sizes for these significant correlations exceeded Field's (2009) $r = 0.9$ cut-off, no multicollinearity was found between variables so all were included in the same mediation analysis (see Figure 1). Diagnosis, coded as a binary variable, was entered as a covariate.

The significance of direct and indirect effects was determined based on the upper and lower 95% bias-corrected confidence intervals (CI), not including zero.

A model summary generated an adjusted $R^2 = .41$, implying that the three predictors explained 41% of variance in the SBQ-R ratings, with the model reaching statistical significance, $F(4,81) = 14.41$, $p < .001$. The total effect of the relation between childhood trauma (CTQ) and suicidality (SBQ-R) before accounting for the effect of emotion dysregulation and interpersonal difficulties was significant ($B = .049$, $SE = .0164$, $p < 0.01$, 95% CI [.0163, .0816]), such that high levels of childhood trauma were associated with higher levels of suicidality. The direct effect of the relation between childhood trauma and suicidality became non-significant after controlling for emotion dysregulation and interpersonal difficulties ($B = .0181$, $SE = .0150$, $p = .231$, 95% CI [-.0118, .0480]). The total indirect effect via the mediators (the difference between the total and direct effects) was significant (point estimate of .0308, $SE = .0094$, 95% CI [.0151, .0524]. The specific indirect effects for the mediation analysis are reported in Table 5.

Table 5. Specific indirect effects of potential mediators.

	Point estimate of indirect effect from bootstrapping	**Standard Error (SE)**	**BCBCI[a]**	
			Lower	**Upper**
DERS	.021	.0080	.0081	.0394*
IIP-SI	.010	.0078	.0018	.0247*
Total Indirect Effect	.031	.0094	.0151	.0524*

[a]BCBCI is bias corrected bootstrapped confidence interval with 5000 samples.
* Significant mediation effect at $p < .05$ where lower and upper BCBCI values do not include 0.

Both the DERS total score and IIP-32 socially inhibited score appear to be significant mediators in the relationship between childhood trauma and suicidal behavior. In this study, dysfunctional emotion regulation and interpersonal difficulty in the form of social inhibition mediate the relationship between childhood trauma and suicidality in adult men. Since the direct effect (path c') was non-significant in the multiple mediation analysis, these two factors can be said to fully mediate the relationship between childhood trauma and suicidal behavior in the current sample.

Insert Figure 1 here

Discussion

The current study has demonstrated that emotional dysregulation and interpersonal difficulties (being socially inhibited) mediate the relationship between childhood trauma and suicidality in a cohort of adult men. This finding highlights the possible negative collateral and compounding effect of childhood trauma insofar as it predicts suicidality within the context of dysfunctional affect regulation and reduced interpersonal functioning. What follows is the potential to target social isolation and treat emotion regulation difficulties as possible interventions to reduce active suicidality in this population.

An anticipated finding was that greater levels of emotion regulation difficulties were significantly related to greater levels of social inhibition. Experiencing early interpersonal trauma may lead to the development of negative self-to-self, self-to-other and other-to-self relating. These beliefs and patterns of interpersonal functioning may interfere with an individual's ability to seek help from others at times of emotional distress. Indeed, childhood adversity has been linked to unhelpful coping mechanisms such as social disengagement and withdrawal (Stansfeld et al., 2017). Individuals with dysfunctional emotion regulation may

therefore have unhelpful social coping strategies that limit the opportunity to form validating interpersonal networks which in turn support the development of healthy affect regulation. In the absence of longitudinal studies in which variables are temporally ordered, causation cannot be ascertained. What remains is an understanding that both emotion regulation and interpersonal difficulties are affected by childhood trauma, that these two factors influence one another and also increase the risk of suicidality. As such, both emotion regulation and interpersonal functioning should be considered in the prevention of suicide.

Experiencing early adversity such as childhood abuse and/or neglect is considered a general risk factor for poorer adult health outcomes (Maniglio, 2009; Norman et al., 2012). These outcomes spread across societal (high levels of socioeconomic deprivation), community (lack of support and impoverished social networks) and individual (emotional psychological distress, poor mental health and reluctance to seek help) risk factors that are associated with suicidality (Samaritans, 2017). This suggests a negative collateral and compounding effect of childhood abuse on adult outcomes, particularly in relation to suicidality. Subsequent and ongoing difficulties with emotional regulation and interpersonal sensitivities may lead to a type of cumulative "psychological" allostatic load (Mcewen & Stellar, 1993). This may explain why, despite reaching statistical significance, the overall magnitude of the effects of the two mediating factors (emotion dysregulation and interpersonal difficulties) was relatively small in the current study. The variance explained in the mediation may also be small due to the strength of the particular relationship between childhood trauma and emotion dysregulation. This pathway was comparably much stronger than other relationships between key variables (see Figure 1). The relation between child maltreatment and emotion dysregulation is well established in the literature and was also demonstrated in the current study. This fits well with supported neurodevelopmental theories accounting for the impact of childhood trauma on brain and emotion development (Perry &

Pollard, 1997; Schore, 2001). This established pathway, therefore, may account for much of the variance found within the multiple mediation analysis. Suicidality is a multifactorial phenomenon that is the result of a complex interaction between numerous variables. The current study has shown that emotion dysregulation and interpersonal difficulties are part of this complex picture.

The Samaritans' (2017) report 'Dying from Inequality' emphasizes the significant risk of low social support and social isolation on suicidality, particularly in socioeconomically disadvantaged individuals (Fergusson, Woodward & Horwood, 2000; Meltzer et al., 2002). Socioeconomic disadvantage can be said to increase the presence and strength of risk factors whilst concurrently weakening protective factors against it. The current sample represented a cohort of socioeconomically disadvantaged men living in Scotland. In light of the current samples' demographics, Fergusson, Woodward & Horwood's (2000) findings are supported. Low social support is reported in socioeconomically disadvantaged individuals (Samaritans, 2017) and is also a common finding in studies assessing risk factors of suicidality (Johnson et al., 2002; Gunnell et al., 2004; Dennis et al., 2007). Social inhibition may result in impoverished social support, which may increase the risk of suicidality in these men in particular. The current study found an effect of social inhibition on suicidality, which fits with an interpersonal theory of suicide (Joiner, Brown & Wingate, 2005). However, this was a small effect, and it is possible that the social inhibition variable is only one aspect of a more complex interpersonal profile that is influenced by early experiences and which in turns affects risk of suicidality. Along with expression suppression (Zhao, Zhang & Zheng, 2014; Masumoto, Taishi & Shiozaki, 2016), brooding and experiential avoidance (Xavier, Cunha & Pinto-Gouveia, 2017) as affect regulation strategies, we could hypothesize that social inhibition reflects an overall tendency towards interpersonally avoidant coping strategies that may be non-constructive. A useful future study

would be to compare the role of the strategies in predicting suicidality in a prospective design.

The correlational analysis with subscales shed light on the effect of different forms of abuse. Strikingly, childhood sexual abuse was not associated with suicidality, interpersonal difficulties or emotional dysregulation. This finding suggests that CSA may not be the only, or indeed the most important, determinant of negative psychosocial outcomes compared to other forms of child maltreatment, giving weight to assertions that forms of abuse and neglect other than sexual are under-emphasized in research (Norman et al., 2012). Our evidence suggests that the effects of abuse may be cumulative rather than hierarchical. The findings of the current study support earlier research (Mullen et al., 1996) and theory (Briere & Runtz, 1990) arguing that physical abuse often co-occurs with emotional abuse and that this combination is often related to more significant generalized psychosocial difficulties. The context within which different types of abuse and neglect occur may also have implications for wider developmental impact. Abuse perpetrated by a primary caregiver may have a different effect to that of a non-attachment figure on, for example, attachment and consequent interpersonal and affective functioning (Schore, 2001). The decision to use a total CTQ score rather than sub-scale scores in our mediation analysis reflects the absence of a clear pattern of associations for different types of trauma in comparison to the collateral experience of childhood trauma. Future studies could usefully compare potential moderators such as severity, chronicity, perpetrator and perceived meaning, alongside types of abuse. Abuse sub-types differentially associated with the other variables in this study: the clustering of these into one variable may have mitigated individual relationships, contributing to smaller effects.

Gender differences may be the most logical explanation for the contrast between the findings of this study and previous findings (e.g. O'leary & Gould, 2009; Maniglio, 2009), as female samples predominate in the extant research associating interpersonal difficulties and

CSA. Research has highlighted differences in male vs. female interpersonal and social functioning (e.g. Reevy & Maslach, 2001). Moreover, CSA involves an intimate interpersonal violation (Davis & Petretic-Jackson, 2000) and it may be that the specific interpersonal dynamics of CSA with boys differs from those with girls. Consequent interpersonal functioning in adult intimate relationships for male and female survivors of CSA may therefore be affected in different ways. This highlights the importance of the findings for beginning to redress the gender imbalance of the evidence base. A statistical artefact of the higher prevalence of sexual victimization in females are robust findings based on more studies with larger samples. Care should be taken not to draw direct comparisons without acknowledging the relative dearth of evidence for male victims.

Limitations

The sampling strategy ensured that a previously under-examined cohort have been represented, namely adult men with past and/or current suicidality living in an area of socioeconomic deprivation in Scotland, most of whom were unemployed. Whilst this has limited generalizability to the wider population, it also addresses the current tendency to generalize from largely female, middle-class, and/or clinical samples to unrelated populations. Correlational analyses used in this study prohibit firm conclusions about causal mechanisms being made. To address this methodological limitation, theory driven variables were investigated using mediation analysis, however, even with this data analysis strategy, there remains a risk of retrospective bias due to reliance on self-report questionnaires to assess relationships between variables of interest.

Other potential confounding and mediating factors that have been shown to relate to suicidality, such as negative life events in adulthood or substance misuse, were not measured,

nor were specific abuse characteristics. Future studies could measure and control for other variables of interest, as well as trauma-specific characteristics.

The measures used in the study were selected because they have been shown to be valid in non-clinical samples. It is possible, however, that the study was limited by its use of self-report questionnaires. The DERS is a subjective measure that could be biased by current mood. The SBQ-R was chosen as it provides a continuous total score with higher scores indicating greater levels of suicidality. The measure does not capture specific suicidal information such as the number of previous suicide attempts and self-harming history. Neither does it distinguish between suicidal ideation and suicidal behavior. This distinction has been made in previous research and studies that have captured specific suicide characteristics have shown robust relationships between non-suicidal self-injury, suicide ideation and attempted suicide (Klonsky, May & Glen, 2013). This lack of nuance in the measurement tools may, in part, explain the amount of unexplained variance, and may explain why none of the pathways to suicidality in the final model are particularly strong. Despite these potential limitations, it is important to note that the nature of self-report questionnaires may also serve to remove the potential interpersonal barriers that may be perceived by participants who report experiences of childhood trauma and suicidality in interview-based research. As such, the use of self-report measures in the current study may have been advantageous in facilitating more honest responses on the CTQ and the SBQ-R, but we recommend replication with other forms of measurement in a larger sample to allow inclusion of more variables in analysis.

Research Implications

One of the study's findings is that forms of neglect and abuse other than CSA are significantly associated with affect regulation and interpersonal functioning. Indeed,

Horwarth (2007) posits that neglect can result in relationship difficulties in adulthood that are often characterized by social isolation or frequent separations. Although there have been some improvements over recent years, neglect has received considerably less attention than other forms of abuse by researchers and practitioners alike (Turney & Tanner, 2006). Very few studies exist that have prospectively investigated the natural course of neglect and its long-term consequences using longitudinal study designs (Norman et al., 2012). With more methodologically robust empirical studies, there is scope to develop our understanding of the specific consequences for the distinct types of child maltreatment across the life course.

To our knowledge, this study is the first to have investigated emotion regulation and social inhibition as potential mediators in the relationship between childhood trauma and suicidality. As research with this population is still in its infancy, it was decided that understanding broad concepts such as emotion dysregulation more generally would be better suited than researching its specific dimensions. Future research could build on the current study's novel findings by investigating specific domains of dysfunctional emotion regulation. For example, the 'strategies' dimension of the DERS has been implicated in suicidality (Weinberg & Klonsky, 2009; Rajappa, Gallagher & Miranda, 2012). As previously discussed, suicidal behaviors may serve as a (coping) strategy to regulate one's emotional distress (Linehan, 1993; Wagner & Zimmerman, 2006; Samaritans, 2017).

The finding that emotion dysregulation and social inhibition are related may also warrant further investigation. Future studies could aim to explore this association further, either in relation to suicidality or in relation to childhood trauma. Finally, current findings can inform the developmental and evaluation of psychological interventions for men at risk of suicide, in which developing effective interpersonal support – a foundation stone of Interpersonal Psychotherapy (Klerman and Weissman, 1994) and Dialectical Behavior Therapy (Linehan, 1993) – is tailored to meet the specific needs of men.

Clinical Implications

The findings of this study show the importance of emotion dysregulation and interpersonal difficulties (being socially inhibited) in suicidal men who have experienced childhood trauma. Judging from previous studies (e.g. Gunnell et al., 2004), our sample with its high levels of unemployment, low household income and high single relationship-status may have been additionally vulnerable to suicidality as an outcome of early trauma. Given that men are less likely to help-seek for psychological difficulties, and therefore often fall through the gap of clinical services (Galdas, Cheater & Marshall, 2005), it is important for community and non-statutory organizations to know how best to support their clients' psychosocial needs. In the first instance, the presence of early relational trauma, emotion regulation ability and interpersonal functioning should be assessed and targeted in treatment. Whilst clinical guidelines for complex trauma advocated bespoke interventions (NICE, 2004), routine training in managing emotions and developing trustworthy relationships is also advocated (Scottish Government & NHS Education, 2015). Of course, understanding pathways to suicide can inform suicide prevention. With that in mind, the findings of the current study could potentially help shape guidance on suicidality and enhance clinical practice.

Finally, given what is known about the impact of childhood abuse, early intervention is vital in preventing its transmission into adulthood. Taking a preventative rather than curative stance, interventions that target young survivors of abuse may change their life trajectory, thereby reducing the subsequent risk of suicidality. There is scope for schools to intervene early in teaching children who are at risk of abuse and neglect, healthy emotion regulation skills as well as skills in social and interpersonal functioning. Reducing social inhibition and increasing skills in emotion regulation from an early age may be relevant in preventing the potential long-term consequences of child maltreatment, including suicidality.

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Table 1. ***Sample demographic characteristics.***

		N	%
Ethnicity	Caucasian	86	100
Marital status	Married or cohabitating	22	25.6
	In a relationship but living separately	10	11.6
	Divorced	16	18.6
	Widowed	1	1.2
	Single	37	43.0
Income	Less than £5,000	12	14.0
	£5,000 to £10,399	28	32.6
	£10,400 to £15,599	25	29.1
	£15,600 to £20,799	11	12.8
	£20,800 to £25,999	5	5.8
	£26,000 to £36,399	1	1.2
	£36,400 to £51,999	4	4.7
	£52,000 to £77,999	0	0.0
	£78,000 or more	0	0.0
Level of education	Less than high school	2	2.3
	High school	44	51.2
	Technical trades	30	34.9
	University	6	7.0
	Postgraduate or professional	4	4.7
Employment	Employed	23	26.7
	Self-employed	4	4.7
	Out of work but looking for work	10	11.6
	Out of work & not currently seeking work	13	15.1
	Student	1	1.2
	Retired	4	4.7
	Unable to work	31	36.0
Received diagnosis?	Yes	64	74.4
	No	22	25.6
Self-reported mental health diagnosis * Percentages calculated from total number of diagnoses reported (N=66)	Attention deficit hyperactivity disorder (ADHD)	2	3.03
	Anxiety and Depression (dual diagnosis)	17	25.76
	Autism Spectrum Disorder (ASD)	1	1.52
	Bipolar disorder	3	4.55
	Depression	27	40.91
	Neurosis	1	1.52
	Personality disorder	2	3.03
	Post-traumatic stress disorder (PTSD)	8	12.12
	Psychosis	3	4.55
	Work-related stress**	1	1.52
	Not articulated	2	3.03
Received (talking) therapy?	Yes	43	67.2
	No	21	32.8
Professional Seen*	Alcohol/drug counselor	2	4.16
	Army	1	2.08
	Community Mental Health Worker (CMHW)	1	2.08
	Community Psychiatric Nurse (CPN)	3	6.25
	Counselling	2	4.16

	Psychiatrist	19	39.58
	Psychologist	20	41.67

*** Percentages calculated from total number of professionals seen (N=48). Some participants saw more than one professional, hence total > 43.**

**General practitioners commonly use this term to describe non-specific mental health problems preventing someone from being able to attend employment.

Table 2: Prevalence of childhood abuse

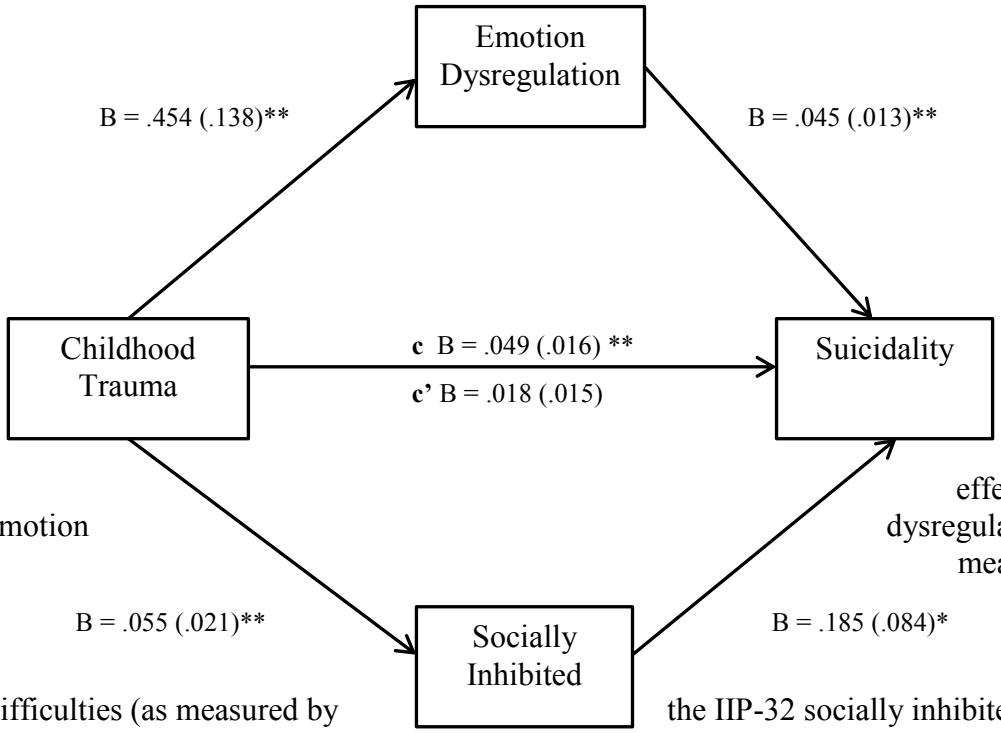
Type of Abuse	None N (%)	Low – Moderate N (%)	Moderate – Severe N (%)	Severe – Extreme N (%)	Total Sample N (%)
Emotional Abuse	24 (27.9%)	14 (16.3%)	17 (19.8%)	31 (36.0%)	62 (72.1%)
Physical Abuse	34 (39.5%)	12 (14.0%)	12 (14.0%)	28 (32.6%)	52 (60.5%)
Sexual Abuse	53 (61.6%)	7 (8.1%)	8 (9.3%)	18 (20.9%)	33 (38.4%)
Emotional Neglect	14 (16.3%)	18 (20.9%)	11 (12.8%)	43(50.0%)	72 (83.7%)
Physical Neglect	26 (30.2%)	6 (7.0%)	24 (27.9%)	30 (34.9%)	60 (69.8%)

Table 3. ***Pearson's correlation matrix showing relationships between variables***

	CTQ Total	**Emotional Abuse**	**Physical Abuse**	**Sexual Abuse**	**Emotional Neglect**	**Physical Neglect**	**DERS Total**	**IIP-32 Socially Inhibited**	**SBQ-R Total**
CTQ Total Score	1	.812**	.787**	.661**	.796**	.793**	.332**	.273*	.299**
Emotional Abuse		1	.633*	.360**	.589**	.506**	.315**	.195	.223*
Physical Abuse			1	.389**	.435**	.530**	.262*	.238*	.359**
Sexual Abuse				1	.372**	.429**	.164	.117	.187
Emotional Neglect					1	.677**	.238*	.284**	.129
Physical Neglect						1	.308**	.209	.252*
DERS Total							1	.558**	.581**
IIP-32 Socially Inhibited								1	.504**

* Correlation is significant at the .05 level (2-tailed); **. Correlation is significant at the .01 level (2-tailed)

Figure 1. ***Mediation model***



Mediating effects of emotion dysregulation (as measured by the DERS total score) and interpersonal difficulties (as measured by the IIP-32 socially inhibited subscale score) on the relationship between childhood trauma (as measured by the CTQ total score) and suicidality (as measured by the SBQ-R total score). All figures represent uncorrected path Beta-coefficients with the SE provided in parentheses.
*. Significant at the $p < .05$ level. **. Significant at the $p < .01$ level.